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PROCEEDINGS  
OF  
THE ROYAL SOCIETY.

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1832-1833.

No. 14.

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November 21, 1833.

JOHN WILLIAM LUBBOCK, Esq., M.A., V.P. and Treasurer,  
in the Chair.

A paper was read, entitled, "Historical Notice to the supposed Identity of the large mass of Meteoric Iron now in the British Museum, with the celebrated Otumpa Iron described by Rubin de Celis, in the Philosophical Transactions for 1786." Communicated in a letter from Woodbine Parish, jun., Esq., F.R.S., to Charles Konig, Esq., Foreign Secretary of the Royal Society.

The mass of iron in question was transmitted to Buenos Ayres, for the purpose of being manufactured into fire-arms, at the period when the people of that country declared themselves independent of Spain ; but a supply of arms having in the meanwhile arrived, it was deposited in the Arsenal, and afterwards given to Mr. Parish, who transmitted it to England. Its identity with the mass of iron described by De Celis, though probable, is not exactly determined.

A paper was also read, entitled, "Observations of Nebulæ and Clusters of Stars, made at Slough, with a Twenty-foot Reflector, between the Years 1825 and 1833." By Sir John F. W. Herschel, K.H., F.R.S.

This paper contains the results of observations begun in 1825, and assiduously prosecuted till the commencement of the present year, for the purpose of reviewing the nebulæ and clusters of stars discovered by his father, the late Sir William Herschel, and also of extending his discoveries, and enlarging our knowledge of the nature and physical constitution of those remarkable and mysterious bodies. Since the recent improvements in the achromatic telescope, and the increased diligence of astronomers in surveying every part of the heavens, and detecting the passage of comets, the want of an extensive list of nebulæ has become continually more urgent ; and hence the author was induced to supply, as far as he was able, that deficiency, which he has now attempted by simply stating the results of his own observations, in preference to waiting until he could present them to the Society in the more complete form of a general catalogue of nebulæ and clusters visible in this latitude. All the observations here given have been reduced to a common epoch, and arranged in the

order of right ascension : and in every case where the same object was observed more than once, all the observations relating to it have been collected together ; by which means they not only can be used as a catalogue for reference, but each result carries with it its own weight and evidence.

Great and various are the difficulties attending inquiries of this nature. Many of the nebulae present a surface so large and ill defined, that it is not always easy to determine where the centre of greatest brightness is situated. Vast numbers of the nebulae, indeed, are so extremely faint, as to be with difficulty perceived, till they have been some time in the field of vision, or are even just about to quit it ; so that the observations become hurried and uncertain. In those parts of the heavens where they are most crowded, their prodigious number, as well as their variety, and the interest they excite, render it scarcely possible to proceed with that methodical calmness and regularity which are necessary to ensure numerical correctness. It is also to be recollected, that it is only during the months of March, April, and May, that the richer parts of the heavens can be advantageously observed, and then only in the complete absence of the moon and of twilight. From all these causes conjoined, it will be readily understood, that a much greater latitude of error is incident to observations of nebulae than to those of stars.

The observations registered in this paper comprise 2500 nebulae and clusters of stars,—a number equal to that of those observed by Sir William Herschel : only about 2000, however, are common to both collections, the remaining 500 of the author's being new. Of these last, by far the greater proportion are objects of the last degree of faintness, only to be seen with much attention, and in good states both of the atmosphere and the telescope. The author generally made a sketch of any remarkable nebula that presented itself ; and these drawings accompany the paper. Among these are representations of some very extraordinary objects, which have not hitherto sufficiently engaged the attention of astronomers, and many of which possess a symmetry of parts, and a unity of design, strongly marking them as systems of a definite nature, each complete in itself, and subservient to some distinct, though to us inscrutable, purpose.

In an Appendix, the author enters into a detailed account of the manner in which the reductions have been executed, and how the numbers set down in the catalogue are concluded from those registered at the moment of observation. For effecting these reductions, he pursued a method materially different, and much more convenient and exact, than he employed to reduce his earlier catalogue of double stars.

Various remarks are next made on the figured nebulae. It often occurred to the author, to notice a peculiar state of the atmosphere, which is quite independent of fog or haziness, in which all large stars above the seventh magnitude appear surrounded with photospheres, of a diameter of two or three minutes, or even more, and exactly resembling those about some of the finer specimens of nebulous stars. These appearances come on suddenly, seldom last long, and disap-

pear as unexpectedly as they come : hence the inference is drawn, that the true cause of this phenomenon is atmospheric, and that it is perhaps connected with some highly rarefied material, disseminated in cloud-like, though invisible, masses in the very highest regions of our atmosphere, and possibly the same with that which, when ignited by the passage of electric currents, gives rise to many, if not all, the phenomena of the aurora borealis. Frequent instances occur of the proximity of minute stars to nebulæ ; an appearance which naturally suggests the idea of their composing planetary systems : for the enormous magnitude of the nebulæ, and its consequent probable mass, may, notwithstanding the rarity of its material, give it a gravitating energy, capable of retaining, in orbits three or four times their own diameter, and in periods of great length, small bodies of a star-like character.

Lastly, the author offers some remarks on the constitution of nebulæ which have an elongated or elliptical form, of those which are double, and of those to which the epithets of *hairy* or *filamentous* have been applied ; and considers their relations to ordinary physical laws.

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*Anniversary Meeting, Nov. 30th, 1833.*

HIS ROYAL HIGHNESS THE DUKE OF SUSSEX, K.G.,  
President, in the Chair.

The President delivered the following Address :

GENTLEMEN,

THE third anniversary of my election to this Chair affords me again the opportunity of expressing my grateful thanks for the kindness which I have continued to receive from you. I would willingly enlarge upon a topic which is so grateful to my feelings, were I not conscious that by so doing I should merely vary the form of phrases which the natural expression of my sentiments prompted me to use when I have before had the pleasure of addressing you, whilst the sentiments themselves remain not merely unchanged, but, I trust, likewise unchangeable. If I am thus brief, therefore, Gentlemen, in the public declaration of my acknowledgements, from a fear of being tedious by their too frequent repetition, I hope that you will not upon that account consider them the less sincere, or that the long experience which I have had of your support and co-operation has made me less sensible of their value.

When I last had the honour of addressing you, it was a source of pride and happiness to me to be empowered to announce to you the gracious intentions of His Majesty to continue to the Royal Society the Annual Grant of two Gold Medals, which had been previously conferred on the Royal Society by his Royal Predecessor.

It must be well known to you, Gentlemen, that these Royal Medals were not adjudged during the two first years that I presided over the Royal Society ; and as there exist many circumstances con-